



Novaris

Lightning and Surge Protection

Application Note and
Installation Guidelines

SURGE CIRCUIT BREAKERS (SCB) SCB1-3-80 and SCB1-3-25

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Thank you for choosing a Novaris product for your surge protection requirements. This Application note explains the operation and features of your Surge Circuit Breaker (SCB) as well as installation guidance.



SCB1-3-80



SCB1-3-25

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1. Application

Novaris Surge Circuit Breakers (SCB) are an over current protection device (OCPD) specially designed for the protection of parallel connected single port AC powerline surge protectors. The Novaris product families of SD, SDD, SDD2, IDD2, IDD3, SDEV and SDH are single port surge diverters that will benefit by being protected with SCB's.

Parallel connected powerline SPD's are usually referred to as Surge Diverters and they are connected between the live and neutral lines in both 3-Phase, 2-Phase and single-phase power systems.

They most usually contain Metal Oxide Varistors (MOV) which can overheat, explode and even catch fire when exposed to continuous over voltage or a surge current above their maximum ratings, they need to be protected in this event with a device that can break the powerline AC current flowing through them so that the risk of overheating and fire is minimised.

Traditionally this single port surge diverter over current protection was provided by conventional circuit breakers or fuses, but this is not ideal for two reasons;

1. To pass the high frequency surge currents the fuses or circuit breakers need to have a higher AC current rating than consistent with good protection against overheating and fire within the SPD.
2. Surge currents can cause the fuses to blow or a circuit breaker to trip even when the SPD is still healthy, this is called nuisance tripping and it may not be detected, this leaves the facility with no surge protection until the trip is noticed.

SCB's are designed to discriminate between power frequency (50-60Hz) currents and the high frequency currents produced by lightning and powerline switching transients.

This discrimination means that are able to have markedly different tripping currents for the two types of waveform allowing them to provide a high degree of protection to the SPD at powerline frequencies whilst allowing very large surge currents to be passed without the risk of nuisance tripping that is characteristic of fuses and conventional circuit breakers when used to protect parallel connected SPD's.

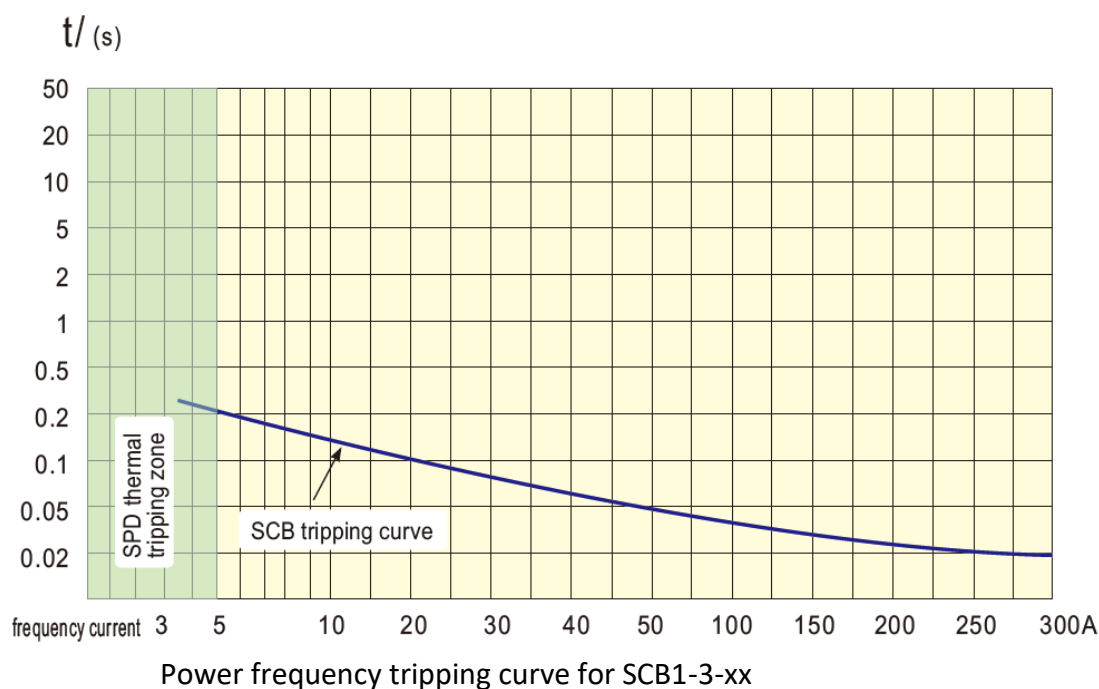
The SCB eliminates these problems by having an AC power (50-60Hz) tripping current of only 3 Amps whilst also having a very high surge current tripping value of 80,000 Amps at 8/20 μ S, or 25kA at 10/350 μ S depending on the model.

It is this ability to discriminate between power and surge frequencies that makes the SCB the ideal choice for protection of parallel connected surge diverters.

For surge diverters with I_{max} up to 80kA (8/20 μ S) use the SCB1-3-80 and for surge diverters with I_{max} up to 200kA (8/20 μ S) or I_{imp} of up to 25kA (10/350 μ S) use the SCB1-3-25.

The SCB is suitable for use with single port surge diverters from all suppliers based on the surge current ratings noted above.

The power frequency tripping curve for the SCB's is shown below;



AS/NZS 3000, the wiring rules, has a specific appendix dealing with the selection and application of surge protective devices including the selection of OCPD's. This is appendix F and it should be referred to for guidance in association with this application note.

IEC 60364 and AS 1768 also provide guidance on the installation and wiring requirements to achieve the best performance from the SPD's being protected by any OCPD.

3. Specifications

The data sheets listed below provide all the specification information;

SCB1-3-80, 3 Amps AC and 80kA 8/20 μ S, Data sheet number NDS1.1379

SCB1-3-25, 3 Amps AC and 25kA 10/350 μ S, Data sheet number NDS1.826

4. Installation

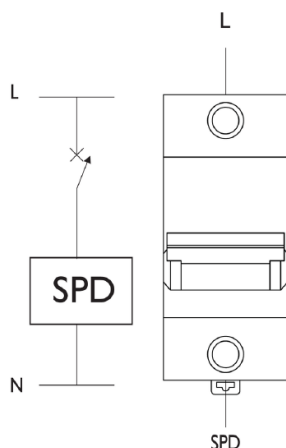
SCB's should be installed on the live side and in series with the SPD being protected as shown in the wiring diagrams below;

The wiring from the live bus bars through the SCB and to the SPD terminals as well as on the neutral side should be kept as short and straight as possible to minimise inductive voltage drop. IEC 60364 , AS1768 and appendix F of AS/NZS 3000 provides guidance on how to minimise inductive voltage drop.

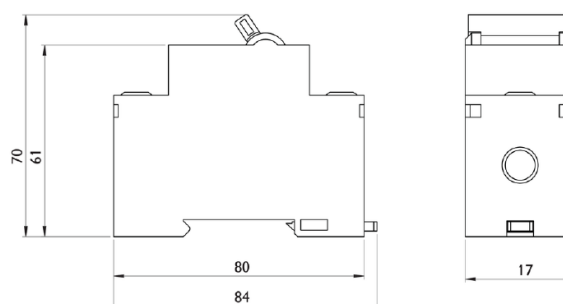
Do not wire the SCB such that it also passes the live load current of the equipment, this will simply result in normal AC tripping if the load is 3A or more.

Novaris recommend a minimum wire cross section of 16mm².

Wiring

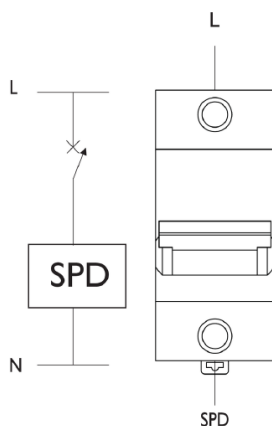


Dimensions

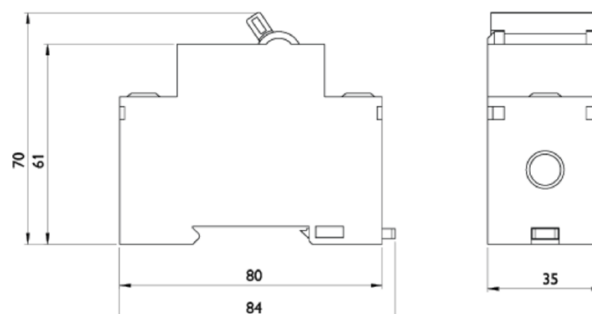


SCB1-3-80

Wiring



Dimensions



SCB1-3-25

For single phase systems a single SCB is required, for two phase systems two SCB's are required and for three phase systems three SCB's are required.

The SCB's are suitable for installation on a standard DIN rail and simply clip into place using the yellow spring-loaded clip at the base.

4. Maintenance

Novaris surge circuit breakers are virtually maintenance free. Maintenance is limited to routine visual inspections and periodic checking of the tightness of the screw clamp terminals.

If the surge diverter the SCB is protecting is damaged by a large surge current, then it is recommended that the SCB is replaced along with the surge diverter.

5. Warranty

This is limited to 5 years and is given by Novaris Pty Ltd (Novaris) to the original purchaser of products made by Novaris ("the products"). The warranty certificate must be completed by the distributor and the purchaser in order to claim under this warranty.

1. What Novaris will do

If the product fails under normal use and service because of a manufacturing defect in materials or workmanship within 5 years from the date of purchase Novaris will at its option, either repair or replace the product with an equivalent product. The repaired or replacement product will be warranted under the terms of this warranty for the remainder of the warranty period for the product originally supplied.

2. How to obtain warranty service

To obtain warranty service you must return the product to Novaris. The product must be accompanied by the warranty certificate duly completed along with your sales receipt or invoice. Freight and insurance is your responsibility.

3. What is not covered

This warranty does not cover any failure of equipment not supplied by Novaris or any consumables* attached to or forming part of the product nor does it cover any failure of or damage to the product due to:

it being connected to equipment or accessories not authorised by Novaris.

improper handling, misuse, neglect, accident, improper installation or non compliance with the directions for use;

any alteration or modification which in the opinion of Novaris will affect the ability to service the product, or

repair by anyone other than an authorised Novaris service agent

No guarantee is given concerning the operation of surge or transient protection products since atmospheric lightning discharges are an unpredictable process subject to the laws of nature and independent of human control. The products do not provide total protection. Component parts of some products may be sacrificial when exposed to the effects of lightning and also voltage surges and transients. Novaris does not guarantee repair or replacement services will be available after expiration of the 5 year warranty period.

4. Rights under the Trade Practices Act

It is acknowledged by Novaris that, under applicable State and Commonwealth Law certain conditions may be implied and rights and remedies conferred on the purchaser in relation to the product which cannot be excluded, restricted or modified by agreement (non excludable rights).

Novaris disclaims all express or implied conditions and warranties in relation to the product other than the express terms of this warranty and any excludable rights. Novaris' responsibility to the Purchaser is, where permitted, limited to the undertakings stated in section 1 of this warranty and subject to the above, in no event is Novaris liable (where before or after discharge of the contract for supply of the product or otherwise) for any loss or damage suffered by the Purchaser as the user caused or contributed to by negligence of Novaris, its servants or agents, nor is Novaris liable for special, incidental, indirect or consequential loss or damage suffered by the Purchaser including but not limited to economic loss, loss of profit or revenue or reputation or costs arising from the loss of use of the product.

*consumables include indicator lamps and illumination sources, items made wholly or partly of glass or ceramic material, electrical elements, transformer windings, electric motors, reconditioned parts and batteries.